PROJECT NUMBER: 1308
PROJECT TITLE: Papermaking Process Development
PROJECT LEADER: R. M. Rogers
PERIOD COVERED: June, 1989

I. HANDSHEET PRODUCTION

A. **Objective**: Develop proprietary cigarette papers for low sidestream and other new product applications.

B. **Results**: Handsheets were produced to evaluate precipitated sol-gels formed via the organic process. Calcium phosphate gel precipitate exhibits sheet making properties similar to other fillers formed via the organic process. Poor sheet drainage limits usage levels. Sheets containing 10% gel and 20% calcium carbonate exhibit low porosity levels with extremely poor brightness and opacity. However, both the alumina coated calcium carbonate and calcium carbonate gel precipitates exhibit superior sheet making properties similar to commercial calcium carbonate. Brightness, opacity and porosity response to freeness are acceptable. Sidestream smoke evaluations are in progress.

The addition of potassium salts as burning additives appears to substantially reduce sidestream smoke for sheets containing a number of different fillers. Nominal levels of potassium, up to 1.5%, appear to increase burn rate and reduce sidestream smoke. Higher levels decrease burn rate with a further reduction in sidestream smoke. Side stream smoke performance may also be a function of the type of potassium compound. Since the burn rate is also influenced by sheet porosity, the effective potassium level could be matched with the porosity required to achieve acceptable subjectives, possibly with conventional porosity cigarette papers.

The capability to coat water insoluble particle suspensions, such as calcium carbonate or titanium dioxide, on cigarette paper handsheets has been developed. The coating is evenly distributed across and down the sheet with acceptable appearance. This methodology is similar to the operation of either a reverse or forward roll coater.

A variety of different handsheets were produced this month incorporating various fillers, including potassium magnesium phosphate. In addition several carbonate sheets were sized with various potassium compounds in an attempt to alter not only sidestream smoke but also subjectives. The dual wrap concept is being utilized by combining radically different sheets such as low pH inner wraps and alkaline filled outer wraps. Thus the negative subjective character of highly sized sheets, required for sidestream smoke performance, can be isolated by incorporating a porous inner wrap or possibly altered by the inclusion of an acid treated inner wrap.

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C. **Plans**:

1. Continue the preparation of handsheets to evaluate designed fillers and sol-gel preparations.

2. Evaluate the application of potassium compounds to conventional cigarette papers.

3. Investigate the addition of mixes of various fillers and adhesives (sol-gel) to cigarette papers to control sidestream smoke and/or mass burn rate.

II. PILOT PRODUCTION

A. **Objective**: Produce pilot quantities (bobbins) of cigarette paper.

B. **Results**: A series of ten sheets are being produced at Maine in support of the low sidestream smoke project. Four of the sheets are light weight, low filler sheets utilizing calcium carbonate and magnesium carbonate for use as the inner wrap of a dual wrapped cigarette. Two porosity levels were chosen, 13 and 50+ Coresta. The more porous sheet is definitely at the processing limit of the type A flax currently being used. If more porous sheets are required, given the same specifications, another fiber must be used.

Additional refining runs confirmed the difficulty of refining the current shipment of Type A flax. The options available to improve sheet appearance and produce a high porosity paper are limited. Refining levels required to achieve satisfactory appearance produce sheets with low porosity. Other grades of flax or woodpulp blends produce sheets with higher porosity levels and superior appearance. These options are being investigated.

A set of bilayer sheets are being produced to continue evaluations of outer wraps with magnesium-containing compounds and inner wraps with magnesium carbonate. Certain magnesium-containing fillers appear to reduce sidestream smoke delivery but retain substantial negative subjective attributes. The inner layer of magnesium carbonate may alleviate this problem.

A vergeure roll and a stock screen for the secondary headbox at the University of Maine have been installed. These units will be operated during production of bilayer sheets at the end of July.

C. **Plans**:

1. Complete production of low filler inner wraps, bilayers and higher weight single sheets.

2. Modify both the vergeure roll and the new stock screen as required to achieve acceptable performance.

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